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SEPTEMBER 22, 1986
CHEMICAL & ENGINEERING

Scientific news from the Anaheim ACS meeting

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Light-Activated Pesticides

Using the sun to protect plants
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NEWS

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SEPTEMBER 22, 1986

News of the Week

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LETTERS

CHEMICAL SAFETY

Sulfur trioxide

SIR: We would like to report an accident involving the use of sulfur trioxide. This material is being used for the sulfonation of polymers in solution and a fresh ampoule is being opened for each reaction. We have been disposing of the unused portion of sulfur trioxide by dripping a small quantity of water into each open vial every day. The resulting product is sulfuric acid and several weeks are required to complete the dilution process.

Recently, a vial that had been filled with water exploded when turned upside down for collection in a large waste container. Concentrated sulfuric acid was blown all over the laboratory and fortunately no personnel were injured. It appears that this water dilution technique results in a density gradient within the vial in which highly concentrated acid rests on the bottom and pure water floats near the surface. When agitated, these two layers mix to generate an explosive heat of solution and an enormous pressure buildup. We would therefore advise against this disposal method for researchers using anhydrous sulfur trioxide.

Paul B. Willis
Senior Project Manager
Springborn Laboratories Inc.
Enfield, Conn.

History of chemistry

SIR: Alan McClelland's comment on chemical education (C&EN, June 23, page 70) struck some familiar bells (to continue, loosely, his musical analogy). Here at the Center for History of Chemistry (CHOC), we also believe that an important goal for the chemical community is to educate the nonchemical "audience" about the place of chemical issues in daily life. This conviction was shared by the ACS Board when it agreed to cosponsor CHOC in 1982.

History, we have found, is an effective tool for helping students and the general public explore chemical issues. Partly, this is due to the inherent interest that stories about the past hold for many people. But, more important, the history of chemistry provides a framework for understanding the interaction between society's sometimes competing demands and chemistry's ability to respond to those demands.

Various CHOC activities have shown how this can be done. Our traveling exhibit on Joseph Priestley explores the relationships among his politics, his religion, and his science. Our exhibit, "Scaling Up," illustrates the interplay of economic, political, and technical goals in various industrial processes. Our recent publication on polymer pioneers examines the relationship between the opportunities and constraints on individual scientists and the science that they developed. Our oral history program of autobiographical interviews with such leading figures as William O. Baker, Arnold O. Beckman, Carl Djerassi, Herman Mark, Carl Marvel, Charles C. Price, and others document the human side of chemical inquiry, invention, and entrepreneurship. And by collaborating closely with the ACS Eminent Chemists Videotapes Program we also help to provide other working tools based on history for those interested in illustrating the complex relationships between social and technical issues.

It is clear that the audience—and even the "performers"—of chemistry can obtain a richer sense of chemistry's role in the world if ACS actively supports audience education. We applaud McClelland's comments on these issues.

Arnold Thackray, *Director*
Jeffrey L. Sturchio, *Associate Director*
Center for History of Chemistry
Philadelphia

Odorized explosives

SIR: W. V. Ligon's concept of odorized explosives (C&EN, July 21, page 3) as a means to foil terrorism is an intriguing one. However, if an odorant was chosen for human nasal perception, I would tend to disagree with Ligon's contention that terrorists would "self-destruct" by making their own explosives; rather they would probably find clever ways to circumvent the odorant problem. I would suggest that the idea might have more merit if an odorant were used that could be readily perceived, at low concentrations, by properly trained dogs, but not by the human nose. Such a technique has apparently been quite effective with various aspects of marijuana traffic control.

Richard D. Stacy
Tucson

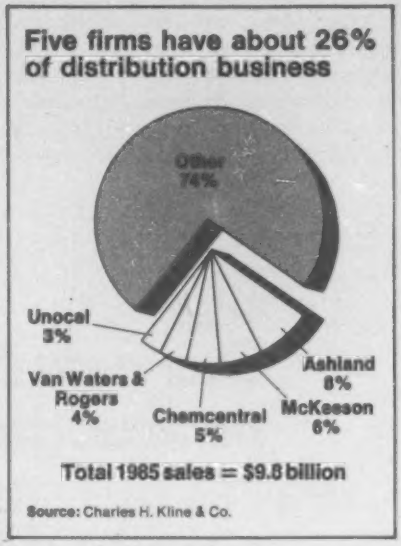
Corrections

- Aug. 4, page 13: American Cyanamid's agreement with Iowa Limestone Co. covers calcium carbonate, not calcium carbide, deposits.
- Aug. 18, page 11: NSF's fiscal 1986 science education budget is $84.5 million, not $53.2 million, because of a $31.3 million transfer from 1985 funding.

Chemical sales via distributors growing

Chemical sales through distributors in the U.S. are forecast to show real growth of about 5.2% per year through 1990, hitting a total of $12.6 billion in 1990 in 1985 dollars, according to a recent study by Charles H. Kline & Co. of Fairfield, N.J. That means chemical distributor sales will grow about 50% faster than overall chemical consumption.

The Kline study notes several driving forces behind the greater sales growth by distributors. For instance, producers are consolidating sales forces and expanding product authorizations to reduce selling costs; producers often realize greater profits on certain products by selling through distributors; customers are maintaining leaner inventories and requiring shorter delivery times; distributors are expanding the services and products that they offer to meet customer needs; and distributors are meeting higher levels of professionalism.



More than 1000 industrial chemical distributors do business in the U.S., according to the Kline report. Although the majority have annual sales of less than $10 million, five firms—Ashland, McKesson, Chemcentral, Van Waters & Rogers, and Unocal—together accounted for nearly $2.5 billion of the $9.8 billion total industrial chemical sales in 1985. Kline predicts that future mergers and acquisitions will result in fewer, but larger, firms in the future.

The study says that, increasingly, chemical producers use distributors as an integral part of their total marketing effort. It adds that, although chemical distributors have existed for decades, their importance has increased in the past decade as producers have increasingly seen distributors in a positive light and consider them an extension of the producers' sales and marketing effort.

The report is available on a subscription basis from C. H. Kline & Co., 330 Passaic Ave., Fairfield, N.J. 07006.

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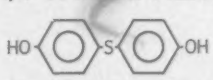

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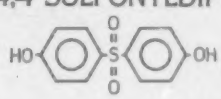

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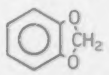

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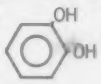

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Outlook Brightens for West European Chemical Firms

Major restructuring, led largely by state-controlled companies, is putting firms in better position to meet overcapacity, other problems

Earl V. Anderson, C&EN New York

The Western European chemical industry is alive, if not kicking as strongly as it should be. It is running into new challenges even before the last ones have been fully overcome. But, according to one respected observer of the European chemical scene, "the prospects of survival, even of growth, are looking better now than for many a year."

Stuart H. Wamsley, director of international chemical research for Greenwell Montagu & Co., London, admits that he hasn't been exactly sanguine about the European chemical industry's prospects in the past. But, he warned his audience at the World Chemical Congress of Marketing & Business Research in Newport Beach, Calif., "This time you are in for a surprise."

Wamsley thinks that a new crop of chemical industry leaders are more willing to learn from lessons of the past. The industry, he says, almost brought about its own demise because of its "horrendous and perpetuated" mistakes. It no doubt will make more mistakes, Wamsley concedes, but he thinks that the first "real flickerings" of a much brighter future are beginning to appear.

Only now is the Western European chemical industry starting to benefit from the substantial drop in oil prices, even though the price cuts started nine months ago. First, the industry faced hefty inventory writedowns. More important, customers who knew that prices would inevitably fall refused to buy petrochemicals and plastics. As a result, says Wamsley, West European chemical volume demand fell 2 to 3% during the first few months of the year. Selling prices tumbled. Chemical company profits dropped 10 to 20% in the first quarter. The second quarter was not much better.

Now, Wamsley sees the situation changing. Because their own stocks are getting low, customers are being forced back into the chemical market. As a result, prices are stabilizing. With almost 25% of Western Europe's ethylene capacity scheduled for maintenance shutdowns during the second half, a fear of shortages is pushing up ethylene prices. Derivatives prices are sure to follow.

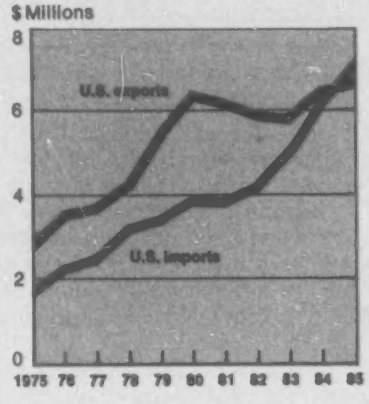
When the full benefits of lower oil prices hit the industry, the results, Wamsley says, will be massive. He points to Imperial Chemical Industries' profit margins, which rose from 12.0% in the fourth quarter of 1985, to 12.8% in this year's first quarter and to 15.4% in the second quarter. In the U.K., indexes of chemical input prices have declined 20% from their peaks, while output prices have continued to rise. These trends, says Wamsley, are now showing up in profit margins.

Plants producing ethylene and the major thermoplastics in Western Europe now are running at about 90% of capacity—sometimes higher, he says. But producers shouldn't be too complacent about that record. Much of the growth in output has gone into exports, not into the domestic European market.

Western Europe exports almost 50% of its chemical output, compared to only about 10% for the U.S. It was export volume, Wamsley contends, that was largely responsible for the European chemical industry's growth in the past couple of years. Thus, although output was rising, it did not keep pace with domestic demand. As a result, chemical imports grew faster than exports. That was true even when currency exchange rates were supposedly favorable to European producers. Now that exchange rates are less favorable, the situation is likely to get worse, Wamsley says.

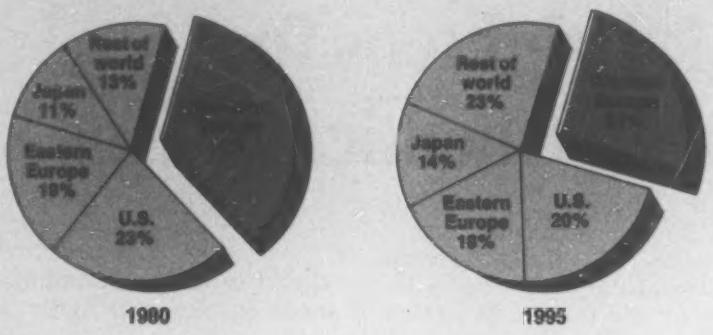
There's also no doubt in Wamsley's mind that Western Europe's share of the world's basic petrochemical production will shrink as plants continue to come on stream in new producing areas. "Europe cannot justify having 12 of the world's top 20 [chemical] companies," says Wamsley, when Africa, the Middle East, and the rest of the developing world have more than 80% of the world's oil and gas reserves, but sell only 13% of its petrochemicals. Europe's share of petrochemical production could drop from about one third to no more than 25% by the end of this decade.

West Europe has chemical trade surplus with U.S.



Source: Department of Commerce

Western Europe's share of world chemical sales will shrink



Source: Greenwell Montagu & Co.

However, don't write Western Europe off as a petrochemical producer. Even with a real growth in chemical demand of only 2 to 3% per year and an inflation rate that would bring chemical sales growth up to 5 or 6%, chemical sales in Western Europe would increase from about $200 billion to about $400 billion in 1995. Such an enormous, heavily concentrated market makes it politically out of the question to visualize anything but a large, European-based industry serving at least a major portion of this demand.

If, however, European chemical producers retain their present product and site mix, Wamsley is certain that low growth will be the norm. It also will take several years to mop up existing overcapacity. In fact, these companies will have to go through another period of "traumatic restructuring," if not by design, he says, then by necessity.

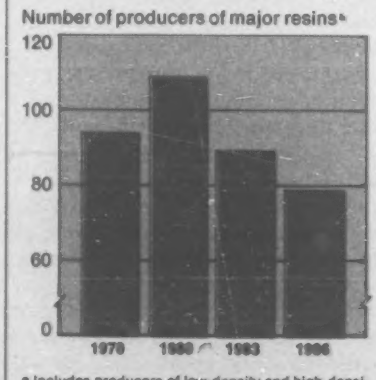
He thinks that this restructuring already is happening in Europe and that it is being led largely by the state-owned or state-controlled companies. Those companies did not participate in the last round of industry restructuring.

A lot of chemical industry restructuring occurred between 1980 and 1982. There are, for instance, far fewer producers of the major thermoplastics in Western Europe now than there were in 1980. Even so, Wamsley believes that there still are too many. Fewer producers, he points out, doesn't always mean an equivalent drop in capacity. There now are only 16 producers of polyvinyl chloride (PVC) in Europe, a drop of 36% from a few years ago. However, only 13% of Europe's PVC capacity has actually been shut down.

Given the many problems facing the European chemical industry, why hasn't it rationalized itself further over the past few years? Wamsley thinks that, in 1983, a revival in chemical demand stopped restructuring in its tracks. More needs to be done, he says, and until recently, odds were that the industry would not make enough progress before the next economic downturn. "Producers will reduce capacities only when they are losing big money," he says.

Another reason why the last capacity shakeout didn't go far enough is the large amount of capacity controlled by state-owned companies. They now control about 40% of Europe's capacity, compared with only 30% a few years ago. "These companies are not known for their willingness to shut down plants," says Wamsley.

Number of resin producers in West Europe is falling



a Includes producers of low-density and high-density polyethylene.

So where does Western Europe's chemical industry go from here? Surprisingly, answers Wamsley, its petrochemicals and plastics producers seem embarked on another major round of restructuring. If it continues, he says, it will go a long way toward solving Europe's overcapacity problem.

A major factor in this awakening, he says, is that many European commodities producers have seen their cash flows and cash reserves deteriorate badly. This is particularly true of the state-owned companies but, this time, he says, the governments will not or cannot bail them out. The only solutions are to restructure, cut capacity, form a joint venture, or disappear completely.

Obvious examples of what is happening include the complete reorganization of the Spanish state-owned companies, the ICI-Enichem deal in PVC, the proposed Enichem-Montedison deal in petrochemicals, and the BP/Atochem joint venture in polypropylene. The list is long. It involves large tonnages. And it's not completed yet. When it is, Wamsley thinks that European producers will be able to cope with the problems posed by the new petrochemical producers of the world.

Yet there always is more that can be done. For instance, Wamsley thinks that there are still two ethylene crackers that should not be operating in Europe because they are not economic. One is the CdF Chemie unit at Dunkirk; the other is Companhia Nacional de Petroquímica's Portuguese cracker. Scrapping them would remove another 550,000 metric tons of annual capacity—4% of Europe's total.

Wamsley believes that if European producers want to regain the initiative from their customers, they must achieve a better supply-demand balance. Only then will there be stable prices and stronger profit margins. Wamsley suggests looking at titanium dioxide. After 15 years of disaster, producers finally achieved a true supply-demand balance. Prices rose about 45% in 18 months. □